MIX TEST-2 [JEE]

Chapter : Thermodynamics + Some Basic Concepts of Chemistry

Stand up again and fight — winners are just those who never gave up.

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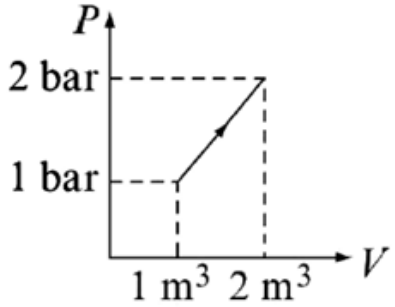
1. **A system absorbs 100 kJ heat in the process shown in the figure. What is ΔU for the system?**



(1) – 50 kJ
(2) + 50 kJ
(3) + 150 kJ
(4) – 150 kJ

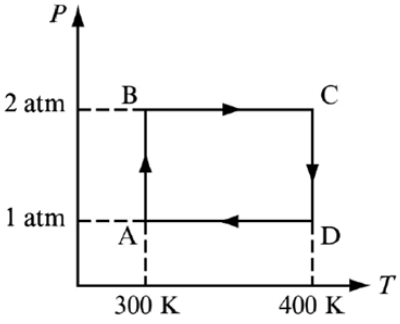
2. **An ideal gas undergoes isothermal expansion from (10 atm, 1 L) to (1 atm, 10 L) either by path–I (infinite stage expansion) or by path–II (first against 5 atm and then against 1 atm). The value of $\frac{q_{\text{path I}}}{q_{\text{path II}}}$ is**

(1) 2.303/1.3
(2) 1.3/2.303
(3) $\frac{1.0}{13 \times 2.303}$
(4) 13×2.303

3. **Two moles of an ideal gas ($C_{V,m} = \frac{5}{2}R$) was compressed adiabatically against constant pressure of 2 atm, which was initially at 350 K and 1 atm. The work done on the gas in this process is**

(1) 250 R
(2) 500 R
(3) 125 R
(4) 300 R

4. **Two moles of helium gas undergoes a cyclic process as shown in the figure. Assuming ideal behaviour of gas, the net work done by the gas in this cyclic process is**



(1) 0
(2) 100 R ln2
(3) 100 R ln4
(4) 200 R ln4

5. **Which of the following statement is incorrect?**

(1) Only a state function may be expressed as difference in its value at two states in any process.
(2) A process cannot be defined on the basis of initial and final states of the system.
(3) In a cyclic process, the internal energy of the system remains throughout constant.
(4) During irreversible process, the equation PV = nRT is not applicable to ideal gas.

6. **An aqueous solution of glucose is 10% (w/v). The volume in which 1 mole of glucose is dissolved, will be**

(1) 181
(2) 91
(3) 0.91
(4) 1.81

7. **Dopamine is a neurotransmitter, a molecule that serves to transmit message in the brain. The chemical formula of dopamine is $C_8H_{11}O_2N$. How many moles are there in 1 g of dopamine?**

(1) 0.00654
(2) 153
(3) 0.0654
(4) None of these

8. **An organic compound contains 40% carbon and 6.67% hydrogen by mass. Which of the following represents the empirical formula of the compound?**

(1) CH_2
(2) CH_2O
(3) C_2H_4O
(4) CH_3O

9. **When a certain amount of octane, C_8H_{18}, is burnt completely, 7.04 g CO_2 is formed. What is the mass of H_2O formed, simultaneously?**

(1) 1.62 g
(2) 6.48 g
(3) 3.24 g
(4) 2.28 g

10. **An amount of 0.3 mole of $SrCl_2$ is mixed with 0.2 mole of K_3PO_4. The maximum moles of KCl which may form is**

(1) 0.6
(2) 0.5
(3) 0.3
(4) 0.1

11. **The mass of 3.2×10^5 atoms of an element is 8.0×10^{-18} g. The atomic mass of the element is about ($N_A = 6\times10^{23}$).** Ans. _____
12. **Twenty molecules of SO_3 will weight as much as ..... molecules of oxygen.** Ans. _____
13. **One mole of an ideal gas at 300 K is expanded isothermally from an initial volume of 1 L to 10 L. The change in internal energy, ΔU, for the gas in this process is** Ans. _____